the Tail. Of two ſorts, the larger above, tending backward from the Spine or Back-bones. The other, from the extremities of the former, tending forward, as in the Breaſts of Fowls: being with the ſame ſort of thoſe in Fowls, which by *Aquapendent* are called *Coſtulæ*.

There is a kind of Diaphragm, a thin tranſparent Membran, as in Birds, ſeparating a ſmall portion, about the fourth part of the Cavity, next the Belly, from the reſt. Wherein is contained a ſmall Ventricle, connexed to the *Gula*: to which is continued an Inteſtine, having ſome little convolution in the conveyance of it; which extended might be about the length of the whole Body, with Head and Tail. The Excrements therein black, or of a ſad *French* Green.

She had a ſmall thin Liver contiguous to the upper part of the Diaphragm: in part divided into two Lobes, of a blackiſh or very ſad colour.

The Lungs ſeemed to be made of Membranous cells or diviſions, very thin and tranſparent, reſembling a little light froth.

The Heart was firm and fleſhy, but very ſmall; and at the very fore end of all the Breaſt or Body.

At the hinder end of the Body was a double Ovary, conſiſting of five or ſix eggs (of the bigneſs of the Greateſt-pins heads, and ſticking to the Back) on each ſide: of the ſame colour and conſiſtence with thoſe of the Yolk of an Egg.

An Account of the Iron-Works in the Foreſt of Dean, *communicated by* Henry Powle, *Eſquire.*

THe Foreſt of *Dean* (comprehending that part of *Gloceſterſhire*, that lies betwixt the Rivers of *Wye* and *Severne*) conſiſts generallyy of a ſtiff Clay: which, according to the nature of thoſe Soyls, is very deep and miry in the Winter, and in the Summer as dry and parched. The Country is full of Hills, but ſo as you may rather call it Uneven, than Mountainous, they being no where high, and rarely of a ſteep aſcent. Betwixt them run great ſtore of little Springs, of a more browniſh colour than ordinary Waters, and often leaving in their paſſage tinctures of Ruſt. The Ground is naturally inclined to Wood, eſpecially Haſle and Oak; of which laſt ſort it hath produced formerly moſt ſtately Timber; though now, almoſt totally devoured by the increaſe of the Iron-Works.

Upon the Surface of the Earth, in many places, lie an abundance of rough Stones, ſome of them of a vaſt bulk; but where they ſink their Mines, they rather meet with Veins of Scaly Stone, than hard and ſolid Rocks. Within the Foreſt they find great plenty of Coal and Iron-Ore; and in ſome places, Red and Yellow Oker: which are all the Minerals, that are yet diſcovered there.

I have been the more particular in this deſcription, becauſe I think it not impoſſible, that by an exact comparing of the Nature and Productions of ſuch Soyls, where Minerals are uſually formed, we may arrive to a certain knowledge, or at leaſt a very probable conjecture, in what places we ought to ſearch after their ſeveral ſorts, and when to deſiſt.

The Iron-Ore, which is the principal Manufacture here, and by which moſt of the Inhabitants ſubſiſt, is found in great abundance in moſt parts of the Foreſt: differing both in colour, weight, and goodneſs. The beſt, which they call their Bruſh-Ore, is of a Blewiſh colour; very ponderous, and full of little ſhining Specks like grains of Silver. This affords the greateſt quantity of Iron; but being melted alone produceth a Metal very ſhort and brittle, and therefore not ſo fit for common uſe.

To remedy this Inconveniency, they make uſe of another ſort of Material, which they call their Cynder, and is nothing elſe, but the Refuſe of the Ore after the Metal hath been extracted; which being mingled with the other in a due quantity, gives it that excellent temper of Toughneſs, for which this Iron is preferred before any that is brought from Forein parts.

But to underſtand this rightly, it is to be noted, That in former times, when their Works were few, and their Vent ſmall, they made uſe of no other Bellows, but ſuch as were moved by the Strength of men: by reaſon whereof their Fires were much leſs intenſe, than in the Furnaces they now employ. So that having in them melted down only the principal part of the Ore; they rejected the reſt as uſeleſs, and not worth their charge. This they call their Cynder, which is now found in an unexhauſtible quantity through all parts of the Countrey, where any former Works have ſtood.

After they have provided their Ore, their firſt work is to Calcine it: which is done in Kilns, much after the faſhion of our ordinary Lime-Kilns. Theſe they fill up to the top with Coal

Coal and Ore, *ſtratum ſuper ſtratum*, until it be full; and ſo putting Fire to the bottom, they let it burn till the Coal be waſted, and then renew the Kilns with freſh Ore and Coal, in the ſame manner as before. This is done without Fuſion of the Metal, and ſerves to conſume the more droſſy parts of the Ore, and to make it friable; ſupplying the Beating and Waſhing, which are uſed to other Metals.

From hence they carry it to their Furnaces, which are built of Brick or Stone, about 24 foot ſquare on the outſide, and near 30 foot in height. Within, not above 8 or 10 foot over, where it is wideſt, which is about the middle; the top and bottom having a narrower compaſs, much like the ſhape of an Egg, as in the Figure. *See Fig.* 4. A *the Tunnel*, C *the Furnace*, B *the Mouth of the Furnace.*

Behind the Furnace are placed two huge pair of Bellows, whoſe Noſes meet at a little hole near the bottom. Theſe are compreſſed together by certain Buttons, placed on the Axis of a very large Wheel, which is turn'd about by Water, in the manner of an Overſhot-Mill. As ſoon as theſe Buttons are ſlid off, the Bellows are raiſed again by the counterpoiſe of weights; whereby they are made to play alternately, the one giving its blaſt all the time the other is riſing.

At firſt, they fill theſe Furnaces with Ore and Cynder intermixt with Fuel, which in theſe Works is always of Charcoal; laying them hollow at the bottom, that they may more eaſily take fire: But after they are once kindled, the Materials run together into a hard cake or lump, which is ſuſtained by the faſhion of the Furnace, and through this the Metal, as it melts, trickles down into the Receivers, which are placed at the bottom, where there is paſſage open, by which they take away the Scum and Droſs, and let out the Metal as they ſee occaſion.

Before the Mouth of the Furnace lies a great Bed of Sand, wherein they make Furrows of the faſhion into which they deſire to caſt their Iron. Into theſe, when their Receivers are full, they let in their Metal; which is made ſo very fluid by the violence of the Fire, that it not only runs to a conſiderable diſtance; but ſtands afterwards boiling for a good while.

After theſe Furnaces are once at Work, they keep them conſtantly employed for many Months together, never ſuffering the Fire to ſlacken night nor day; but ſtill ſupplying the

the waſte of the Fuel and other Materials with freſh, poured in at the top.

Several attempts have been made to bring in the uſe of Sea-coal in theſe Works, inſtead of Charcoal; the former being to be had at an eaſie rate, the latter, not without great expence: but hitherto they have proved ineffectual. The Workmen finding by experience, that a Sea-coal Fire, how vehement ſoever, will not penetrate the moſt fix'd parts of the Ore, and ſo leaveth much of the Metal unmelted.

From theſe Furnaces, they bring their Sows and Pigs of Iron (as they call them) to their Forges. Theſe are of two ſorts, though ſtanding together under the ſame Roof: one they call their Finery, the other, the Chafery. Both of them are open Hearths, on which they place great heaps of Sea-coal, and behind them, Bellows, like to thoſe of the Furnaces, but nothing near ſo large. Into the Finery, they firſt put their Pigs of Iron, placing three or four of them together behind the fire, with a little of one end thruſt into it. Where ſoftening, by degrees they ſtir and work them with long Bars of Iron, till the Metal runs together into a round Maſs or Lump, which they call a Half-Bloom. This they take out, and giving it a few ſtrokes with their Sledges, they carry it to a great weighty Hammer, raiſed likewiſe by the motion of a Water-wheel: where applying it dexterouſly to the blows, they preſently beat it out into a thick ſhort ſquare. This they put into the Finery again, and heating it red hot, they work it out under the ſame Hammer, till it comes into the ſhape of a Bar in the middle, with two ſquare knobs in the ends. Laſt of all, they give it other Heatings in the Chafery, and more workings under the Hammer, till they have brought their Iron into Bars of ſeveral ſhapes and ſizes; in which faſhion they expoſe them to Sale.

All their Principal Iron undergoes all the forementioned preparations: yet for ſeveral purpoſes, as for the Backs of Chimneys, Hearths of Ovens, and the like, they have a ſort of Caſt-Iron; which they take out of the Receivers of the Furnace, ſo ſoon as it is melted, in great Ladles, and pour it into Moulds of fine Sand: in like manner as they caſt Braſs and other ſofter Metals: but this ſort of Iron is ſo very brittle, that being heated, with one blow of a Hammer it breaks all to pieces.

Though

Though this fault be moſt found in this ſort of Iron; yet, if in the working of their Beſt ſort they omit any one Proceſs, it will be ſure to want ſome part of its Toughneſs, which they eſteem its perfection.

A Relation of the making of Ceruſs, *by Sir* Philiberto Vernatti.

FIrſt Pigs of clean and ſoft Lead are caſt into thin Plates a yard long, ſix inches broad, and to the thickneſs of the back of a Knife. Theſe are rolled, with ſome Art, round; but ſo as the Surfaces no where meet to touch: for where they do no *Ceruſs* grows.

Thus roll'd, they are put each in a Pot juſt capable to hold one, upheld by a little Bar from the bottom, that it come not to touch the Vinegar, which is put into each Pot, to effect the converſion.

Next a ſquare Bed is made of new Horſe-dung, ſo big as to hold 20 Pots abreaſt, and ſo to make up the number of 400 in one Bed.

Then each Pot is covered with a Plate of Lead; and laſtly all with Boards, as cloſe as conveniently can be. This repeated four times, makes one heap, ſo called, containing 1600 Pots.

After three Weeks the Pots are taken up, the Plates unrolled, laid upon a Board, and beaten with Battle-dores till all the Flakes come off. Which, if good, prove thick, hard and weighty: if otherwiſe, fuſſy and light; or ſometimes black and burn'd, if the Dung prove not well order'd: and ſometimes there will be none.

From the Beating-Table the Flakes are carried to the Mill; and with Water ground between Millſtones, until they be brought to almoſt an inpalpable fineneſs. After which it is moulded into ſmaller parcels, and expoſed to the Sun to dry till it be hard and ſo fit for uſe.

The Accidents to the Work are,

That two Pots alike ordered, and ſet one by the other, without any poſſible diſtinction of advantage, ſhall yield, the one thick and good Flakes, the other few, and ſmall or none: which happeneth in greater quantities, even over whole Beds ſometimes.

Some-

fig: 1

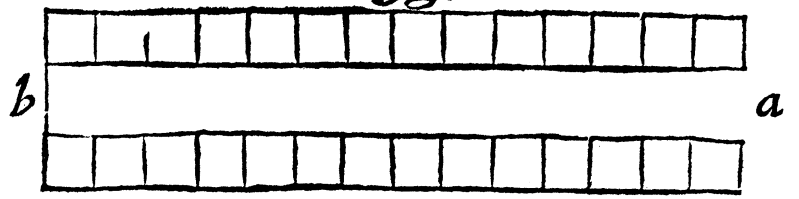

fig: 2

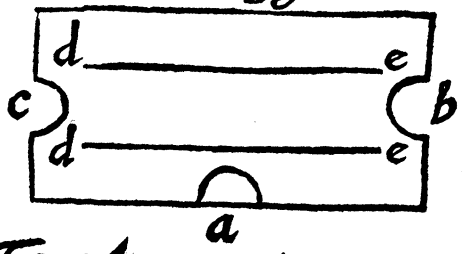

Fig: 3.

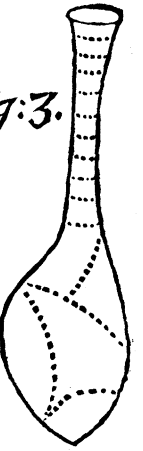

Fig. 4